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Laboratory-confirmed HIV and sexually transmitted infection seropositivity and risk behavior among sexually active transgender patients at an adolescent and young adult urban community health center

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Abstract

The sexual health of transgender adolescents and young adults who present for health care in urban community health centers is understudied. A retrospective review of electronic health record (EHR) data was conducted from 180 transgender patients aged 12–29 years seen for one or more health-care visits between 2001 and 2010 at an urban community health center serving youth in Boston, MA. Analyses were restricted to 145 sexually active transgender youth (87.3% of the sample). Laboratory-confirmed HIV and sexually transmitted infections (STIs) seroprevalence, demographics, sexual risk behavior, and structural and psychosocial risk indicators were extracted from the EHR. Analyses were descriptively focused for HIV and STIs. Stratified multivariable logistic regression models were fit for male-to-female (MTF) and female-to-male (FTM) patients separately to examine factors associated with any unprotected anal and/or vaginal sex (UAVS). The mean age was 20.0 (SD = 2.9); 21.7% people of color, 46.9% white (non-Hispanic), 21.4% race/ethnicity unknown; 43.4% MTF, and 56.6% FTM; and 68.3% were on cross-sex hormones. Prevalence of STIs: 4.8% HIV, 2.8% herpes simplex virus, 2.8% syphilis, 2.1% chlamydia, 2.1% gonorrhea, 2.8% hepatitis C, 1.4% human papilloma virus. Only gonorrhea prevalence significantly differed by gender identity (MTF 2.1% vs. 0.0% FTM; $p = 0.046$). Nearly half (47.6%) of the sample engaged in UAVS (52.4% MTF, 43.9% FTM, $p = 0.311$). FTM more frequently had a primary sex partner compared to MTF (48.8% vs. 25.4%; $p = 0.004$); MTF more frequently had a casual sex partner than FTM (69.8% vs. 42.7% $p = 0.001$). In multivariable models, MTF youth who were younger in age, white non-Hispanic, and reported a primary sex

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partner had increased odds of UAVS; whereas, FTM youth reporting a casual sex partner and current alcohol use had increased odds of UAVS (all $p < 0.05$). Factors associated with sexual risk differ for MTF and FTM youth. Partner type appears pivotal to understanding sexual risk in transgender adolescents and young adults. HIV and STI prevention efforts, including early intervention efforts, are needed in community-based settings serving transgender youth that attend to sex-specific (biological) and gender-related (social) pathways.

Keywords

transgender; youth; HIV; STI

Introduction

According to the Centers for Disease Control and Prevention (CDC), youth (aged 13–24 years) comprised 17% of the US population in 2010, but accounted for an estimated 26% (12,200) of all new HIV infections (47,500) nationally (CDC, 2014). Youth also made up roughly 50% of all incident sexually transmitted infections (STIs) in the USA in 2008, with 51% of these occurring in young women and 49% in young men (CDC, 2013). Transgender individuals, or people who have a gender identity or gender expression different than their assigned sex at birth, appear to be disproportionately burdened by HIV and STIs (CDC, 2007, 2011), although HIV and STI incidence data are scarce (Nuttbrock et al., 2014). Young people on the male-to-female (MTF) spectrum – those assigned a male sex at birth who identify as women, transgender women, or other diverse transfeminine gender identities – have been shown to be highly vulnerable to acquisition and transmission of HIV infection with HIV seroprevalence as high as one in four in this community (Herbst, Jacobs, McKleroy, Neumann, & Crepaz, 2008). Few existing data exist on female-to-male (FTM) spectrum people (Reisner, White, Mayer, & Mimiaga, 2014), and even more rare are studies in FTM youth, individuals assigned a female sex at birth who identify as men, transgender men, FTM, or another diverse trans masculine gender identity.

Mental health (Herbst et al., 2008; Pengpid, Peltzer, & Skaal, 2013), substance use (Sevelius, Reznick, Hart, & Schwarcz, 2009), partner type (primary vs. casual; Brown & Vanable, 2007; Macaluso, Demand, Artz, & Hook, 2000; Operario, Nemoto, Iwamoto, & Moore, 2011), and sex work (Reisner et al., 2014; Yadav et al., 2005) are associated with sexual risk behaviors in the general population and in adult transgender populations, particularly among MTF spectrum samples. High prevalence of these risk factors has been documented in MTF transgender youth (Garofalo, Deleon, Osmer, Doll, & Harper, 2006; Grossman & D'Augelli, 2007). However, only partner type (primary male partnerships) and sex work have been shown to be associated with sexual risk in MTF spectrum people (Wilson, Garofalo, Harris, & Belzer, 2010; Wilson et al., 2009). CDC HIV and STI surveillance data define youth as 12–24 years; however, we conceptualize youth as including not only adolescents but also emerging adults ages 12–29 years. No published scientific reports – that we are aware of – are available comparing HIV, STIs, and sexual risk behaviors between MTF spectrum and FTM spectrum adolescents and emerging adults. Data that examine structural and psychosocial risk factors that may drive HIV, STIs, and

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sexual risk differentially for MTF and FTM youth are also lacking. Given the lack of inclusive US health surveillance efforts on the health of transgender individuals (Conron, Landers, Reisner, & Sell, 2014), electronic health record (EHR) data have been identified as an important source of health-related information (Cahill & Makadon, 2014; Deutsch et al., 2013). For this study, EHR data were used to examine the prevalence of laboratory-confirmed HIV and STIs among young transgender youth accessing services at an urban adolescent and young adult community health center serving those ages 12–29 years old, and to explore sexual behavior, and structural and psychosocial factors to inform the development of future interventions in clinical settings among this group.

Method

Study design, participants, and procedures

This study conducted a retrospective review of EHR data from 180 transgender patients ages 12–29 years seen consecutively for one or more health-care visits between 2001 and 2010 at an urban community health center serving adolescents and young adults in Boston, MA. Of transgender patients seen, 14 (7.8%) did not have data in their medical records indicating sexual activity status and were excluded from the data analytic sample. Among the 166 youth who had data on sexual activity, 145 were sexually active (n = 63 MTF, n = 82 FTM). The proportion of MTF (88.7%) and FTM (86.3%) youths who were sexually active did not significantly differ ($\chi^2 = 0.21$, df = 1, $p = 0.64$). Analyses were restricted to 145 sexually active patients (87.3% of the original sample) and data were treated as a cross-sectional sample.

Measures

Extracted from the EHR and included in this analysis were demographic variables including: age (continuous in years calculated from date of first visit) and race/ ethnicity (white non-Hispanic, people of color, unknown race/ethnicity). Additional binary (yes/no) variables were: (1) HIV and STI seroprevalence: laboratory-confirmed HIV, herpes simplex virus (HSV), syphilis, gonorrhea, chlamydia, hepatitis C, and/or human papilloma virus (HPV); (2) sexual risk behavior: condomless anal and/or vaginal sex; and (3) socio-structural and psychosocial risk indicators: cross-sex hormones for gender affirmation; sex partner type (having a current, primary sex partner; having a casual sex partner); having ever engaged in sex work; Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV-TR; APA, 2000) diagnosed depression; DSM-IV-TR diagnosed anxiety; current alcohol use; current marijuana use; and unstably housed (i.e., homeless, not stably housed, couch surfing with friends as noted in the provider social history of the EHR).

Data analysis

Data analysis was conducted using SAS v9.3. Univariate statistics were used to examine the distribution of variables (mean, standard deviation, and proportion). Data for HIV and STIs were descriptively focused with bivariates given small cell sizes, rather than fitting multivariable adjusted models. MTF and FTM youth were compared. The t-tests (pooled; equal variances were tested for and the null hypothesis of non-equal variances was not supported for any of the variables) were used to assess mean differences; chi-square tests

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were used to examine any differences in expected and observed proportions by gender identity spectrum (sparse data where cell sizes were <5 utilized Fisher's exact tests to obtain exact *p*-values and still reported chi-square test statistics). Stratified multivariable logistic regression models were fit for MTF and FTM youth separately to examine factors associated with sexual risk behavior (any condomless anal and/or vaginal sex yes/ no). A stratified approach was implemented for analyses because: (1) the risks for MTF and FTM youth are conceptualized as distinct and thus models restricted to MTF and FTM youth separately are aligned with such a theoretical viewpoint; (2) stratified models allow data from this study to be compared to other similar studies which have been restricted to MTF youth (Garofalo et al., 2006). Model building commenced with examining bivariate models for statistical significance. Then, factors significant at the $p < 0.05$ level were entered into a multivariable model, and independent associations were examined using the stepwise backward elimination method (Afifi, May, & Clark, 2003). This technique begins with all the variables in the equation and proceeds by eliminating the least useful variables one at a time using the computed *F*-to-remove statistic (Afifi et al., 2003).

Results

As shown in Table 1, the mean sample age was 20.0 (SD = 2.9); 21.7% people of color (non-white and/or Hispanic), 46.9% white (non-Hispanic), 21.4% race/ethnicity unknown. The sample was comprised of 43.4% MTF and 56.6% FTM. Overall, 68.3% were on cross-sex hormones. Prevalence of STIs is reported in Table 1. Only gonorrhea prevalence significantly differed by gender identity ($p = 0.046$).

Several STI risk factors differed by gender identity. FTM more often had a primary sex partner compared to MTF ($p = 0.004$); MTF more frequently had a casual sex partner than FTM ($p = 0.001$). MTF more often engaged in sex work than FTM ($p < 0.0001$).

Nearly half (47.6%) of the sample engaged in condomless vaginal and/or anal sex. The proportion did not differ by gender identity (52.4% MTF, 43.9% FTM, $p = 0.311$). In a multivariable logistic regression model (Table 2), MTF youth who were younger (OR = 0.75; 95% CI = 0.61, 0.92) and reported a primary sex partner had increased odds of condomless vaginal and/or anal sex. MTF of color (OR = 0.18; 95% CI = 0.04, 0.75) and unknown race/ethnicity (OR = 0.14; 95% CI = 0.02, 0.94) had decreased odds of condomless vaginal and/or anal sex compared to white (non-Hispanic) young people in this model. A parallel multivariable logistic regression model specific to FTM youth (Table 2) found those having a casual sex partner (OR = 3.38; 95% CI = 1.27, 9.03) and current alcohol use (OR = 3.06; 95% CI = 1.12, 8.35) had increased odds of condomless vaginal and/or anal sex.

Discussion

This study examined laboratory-confirmed prevalence of HIV and other STIs in transgender patients presenting for care at an urban adolescent and young adult community health center. HIV and STI prevalence did not differ significantly by gender identity, with the exception of gonorrhea prevalence, which was significantly higher in MTF than FTM youth. This

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elevated gonorrhea prevalence in MTF vs. FTM youth is consistent with CDC epidemiologic data reporting sex differences in gonorrhea as higher prevalence of gonorrhea is seen in non-transgender females relative to non-transgender male youth at the US population level (CDC, 2012). Findings from this study support sex-specific pathways to biological STI transmission. Gender-specific pathways were also found to be relevant for youth in this study as relationship indicators and factors associated with sexual risk in varying types of sexual partnerships were found to differ between MTF and FTM youth. Specifically, partner type (primary vs. casual) appears central to understanding sexual risk in MTF and FTM youth as having a primary partner was associated with sexual risk taking (i.e., condomless anal/vaginal sex) in MTF youth, whereas having a casual partner was associated with sexual risk among FTM youth. MTF youth also more frequently had casual sex partners and engaged in sex work, while FTM youth more often had a primary sex partner. Demographic and behavioral risk factors were also found to be differentially associated with sexual risk in MTF versus FTM youth, as sexual risk taking was associated with being young and white (non-Hispanic) in FTM youth, while current alcohol use was associated with sexual risk in FTM youth. Given that casual partnerships and sex work can place individuals as risk of acquiring HIV and other STIs (Baral et al., 2013; Hoffman, 2014; Operario, Soma, & Underhill, 2008; Sanchez et al., 2006), prevention efforts, including early intervention programs, that are attentive to both sex-specific (biological) and gender-specific (social) pathways to HIV and STI risk are warranted in community-based settings serving transgender youth. This study is not without limitations. First, the primary reason youth presented for care was not captured (i.e., primary care, mental health, HIV, and STI testing specifically). The chart review method utilized meant that incomplete documentation, missing charts, unrecorded information, and difficult interpretation of the information contained in the documents (e.g., due to sexual risk or STI jargon and acronyms reported in provider notes) may have produced unintended bias (Dworkin, 1987; Gearing, Mian, Barber, & Ickowicz, 2006; Hess, 2004; Krowchuk, Moore, & Richardson, 1995). Variance in the quality of information recorded by the medical professionals in shared EHR fields (e.g., social history) may have weakened the integrity of the data (Pan, Fergusson, Schweitzer, & Hebert, 2005). In addition, gender affirmation by sexual partners – having one's gender identity affirmed or validated – has been shown to play a significant role in the sexual risk behavior of adult MTF, particularly transgender women of color (Melendez & Pinto, 2007; Sevelius, 2013). Prior research with adult MTF adult women suggests that sexual risk may be most likely with sexual partners who affirm their gender, particularly in the context of a primary male partner (Bockting, Robinson, & Rosser, 1998; Melendez & Pinto, 2007; Nemoto, Operario, Keatley, & Villegas, 2004; Operario et al., 2011). Gender affirmation has also been shown to be an important determinant of adult FTM adult men's sexual health including sexual risk behaviors with non-transgender MSM (Reisner, Perkovich, & Mimiaga, 2010; Sevelius, 2009). Given the chart review nature of this study, it was not possible to measure gender affirmation processes, which represents a limitation of this research and direction for future study. Limitations notwithstanding, this study provides new information on the relationship between risk factors and sexual risk behaviors in transgender youth, specifically in the differences between MTF and FTM youth. Partner type is a fluid concept and “primary partner” is not equal to monogamy both in terms of how study data were extracted from medical records and in terms of youth practice and behavior.

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Findings suggest that factors associated with the sexual risk behavior of MTF and FTM adolescents and young adults differ. As previously demonstrated in MTF samples (Operario et al., 2011; Wilson et al., 2009; Wilson et al., 2010), partner type appears to be a key aspect of sexual risk among transgender youth in this clinic sample. Findings should be taken into account in clinical practice with transgender youth, including assessment of sexual histories with these patients. Clinicians should ensure that transgender youth receive health care, including HIV and STI screening prevention (e.g., preexposure prophylaxis), with their specific, differing needs, and risk profiles in mind – including attention to sex-specific (biological risks) and gender-specific (socially patterned) factors. More research is needed to examine further differences in sexual risk behaviors and HIV and STI acquisition between MTF and FTM youth. Future research should take into account the current study's cross-sectional findings regarding differing behaviors and the levels of risk associated with these behaviors. Longitudinal data in this area are needed to understand and attend to the dynamic pathways and mechanisms, including gender affirmation, associated with HIV and STI risk in transgender youth by partner type across adolescent and young adult development.

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Table 1

Demographics, sexual health, and psychosocial risk factors among sexually active transgender adolescents and young adults (n = 145): comparing MTF (n = 63) and FTM (n = 82) youth.

							Bivariate comparisons MTF vs. FTM	
	MTF n = 63		**FTM n = 82**		**Total sample n = 145**		***t*-test (df)**	***p*-value***
Age in years								
Mean (SD)	19.4 (3.2)		20.5 (2.6)		20.0 (2.9)		2.37 (143)	**0.019**
Range	14–29		15–28		14–29			
	n (%)		*n* (%)		*n* (%)		χ^2 (df)	*p*-value
White (non-Hispanic)	18 (28.6)		50 (61.0)		68 (46.9)		23.24 (2)	**<0.0001**
People of color	33 (52.4)		13 (15.8)		46 (31.7)			
Unknown	12 (19.0)		19 (23.2)		31 (21.4)			
Gender affirmation								
Cross-sex hormones	45	71.4	54	65.9	99	68.3	0.51 (1)	0.475
STIs								
HIV infection	5	7.9	2	2.4	7	4.8	2.34 (1)	0.126
HSV	3	2.1	1	1.2	4	2.8	1.67 (1)	0.197
Syphilis	3	4.8	1	1.2	4	2.8	1.67 (1)	0.197
Chlamydia	2	3.2	1	1.2	3	2.1	0.67 (1)	0.412
Gonorrhea	3	2.1	0	0.0	3	2.1	3.99 (1)	**0.046**
Hepatitis C	2	3.2	2	2.4	4	2.8	0.07 (1)	0.789
HPV	2	3.2	0	0.0	2	1.4	2.64 (1)	0.104
HPV vaccination	7	11.1	26	31.7	33	22.8	8.60 (1)	**0.003**
Unprotected anal and/or vaginal sex (UAVS)								
Yes	33	52.4	36	43.9	69	47.6	1.03 (1)	0.311
No	30	47.6	46	56.1	76	52.4		
Socio-structural and psychosocial risk factors								
Primary sexual partner	16	25.4	40	48.8	56	38.6	8.22 (1)	**0.004**
Casual sexual partner	44	69.8	35	42.7	79	54.5	10.60 (1)	**0.001**
Sex work	21	33.3	1	1.2	22	15.2	28.55 (1)	**<0.0001**
Depression	27	42.9	45	54.9	72	49.7	2.06 (1)	0.151

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	MTF n = 63		FTM n = 82		Total sample n = 145		Bivariate comparisons MTF vs. FTM	
							t-test (df)	p-value*
Anxiety								
Current alcohol use	32	50.8	48	58.5	80	55.2	0.86 (1)	0.353
Current marijuana use	25	39.7	27	32.9	52	35.9	0.71 (1)	0.401
Unstably/marginally housed	16	25.4	11	13.4	27	18.6	3.38 (1)	0.066

Bold indicates statistical significance ($p < 0.05$).

*Reported p-values are from Fisher's exact tests where cell sizes are small (less than 5).

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Table 2

Stratified analyses of sexual risk behavior in sexually active transgender adolescents and young adults (n = 145): bivariate and multivariable logistic regression models in MTF and FTM youth.

	MTF				FTM			
	Bivariate models		Multivariable model		Bivariate models		Multivariable model	
	OR (95% CI)	*p*-value	OR (95% CI)	*p*-value	OR (95% CI)	*p*-value	OR (95% CI)	*p*-value
Age in years (continuous)	0.81 (0.67, 0.97)	0.021	**0.75 (0.61, 0.92)**	**0.006**	0.89 (0.75, 1.06)	0.207	–	–
White (non-Hispanic)	1.00		1.00	–	1.00		–	–
People of color	0.32 (0.09, 1.11)	0.072	**0.18 (0.04, 0.75)**	**0.018**	1.18 (0.35, 4.04)	0.788	–	–
Unknown	0.28 (0.06, 1.29)	0.101	**0.14 (0.02, 0.94)**	**0.043**	1.24 (0.43, 3.59)	0.688		
No hormones	1.00		–	–	1.00		–	–
Hormones	0.61 (0.20, 1.85)	0.382	–	–	0.55 (0.22, 1.39)	0.206	–	–
No depression	1.00		–	–	1.00		–	–
Depression	1.63 (0.59, 4.46)	0.345	–	–	1.28 (0.53, 3.09)	0.578	–	–
No anxiety	1.00		–	–	1.00		–	–
Anxiety	1.57 (0.54, 4.61)	0.410	–	–	1.81 (0.65, 5.00)	0.253	–	–
No primary sex partner	1.00		1.00	–	1.00		–	–
Primary sex partner	3.71 (1.04, 13.22)	0.043	**6.76 (1.55, 29.53)**	**0.011**	0.49 (0.20, 1.19)	0.112	–	–
No casual sex partner	1.00		–	–	1.00		1.00	
Casual sex partner	0.39 (0.12, 1.20)	0.099	–	–	2.58 (1.05, 6.36)	0.039	**3.38 (1.27, 9.03)**	**0.015**
No sex work	1.00		–	–	–	–	–	–
Sex work	0.75 (0.26, 2.15)	0.593	–	–	–	–	–	–
No current alcohol use	1.00		–	–	1.00		1.00	
Alcohol use current	1.06 (0.40, 2.86)	0.904	–	–	2.27 (0.91, 5.67)	0.079	**3.06 (1.12, 8.35)**	**0.029**
No current marijuana use	1.00		–	–	1.00		–	–
Marijuana use current	1.67 (0.60, 4.63)	0.328	–	–	1.29 (0.51, 3.26)	0.588	–	–
Stably housed	1.00		–	–	1.00		–	–
Unstably/marginally housed	1.23 (0.39, 3.86)	0.720	–	–	1.64 (0.46, 5.88)	0.448	–	–

Bold indicates statistical significance ($p < 0.05$).

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Note: Multivariable models fit using backward selection. MTF model initially included age, race/ethnicity, hormones, depression, anxiety, primary sex partner, casual sex partner, sex work, alcohol use current, marijuana use current, unstably/marginally housed. FTM model included the same variables except for sex work, given small cell size (e.g., 1 case).